



RỒNG VÀNG  
TECHNOLOGY



**Underwater Connectors**  
**ACX series**  
**for deep immersion**

[www.rong-vang-technology.vn](http://www.rong-vang-technology.vn)



## Description

This series of electrical connectors meet the technical requirements of marine standard CB-3939 and can be used under water depths of up to 1 km or deeper.

Mainly used for: underwater power supply and signal control, transmission and data acquisition, underwater cameras, diving and rescue operations, manned or unmanned submarines, ocean exploration and mining, underwater acoustic devices, etc.



## Technical features

### Mechanical

Shell: marine bronze, stainless steel, titanium alloy

Watertight washers, O-Rings: elastomer

Insulator: resistant to high temperature environment

Contacts are non-removable, with the exception of power contacts

Endurance: 500 mating/unmating operations

Free-Fall (connecting plug or plug harness): < 1,5 m

### Environmental

Operating temperature range: up -40°C to + 85°C

Shock: Static acceleration in each axis is 120 g

Fluids Resistance: oil, alcohol, petroleum, diesel, fuel, seawater, natural gas, ethane, propane, freon, various acids

Operating pressure: 10 MPa

### Electrical

Voltage Category	Service voltage (Vrms 50Hz)	Dielectric Withstanding Voltage (Vrms 50Hz)
Service 1	600	1500
Service 2	1000	2300
Service 3	1500	3200
Service 4	5000	10000

Insulation resistance:  $\geq 5000 \text{ M}\Omega$  at 20°C and 60% relative humidity

Contact resistance:  $\leq 10 \text{ m}\Omega$  at 20°C and 60% relative humidity



## Current rating and contact resistance

Shell size	Contact size	Active contact OD	Contact termination OD	Current rating per contact (A)	Contact resistance (mΩ)	Gauge AWG	Section (mm <sup>2</sup> )
9M	20	1.02	0.9	7	≤ 4	26 – 22	0,14 – 0,38
	16	1.59	1.2	14	≤ 3	24 – 20	0,21 – 0,60
10M	20	1.02	0.9	7	≤ 4	26 – 22	0,14 – 0,38
10M 14M	16	1.59	1.4	14	≤ 3	22 – 18	0.38 – 0.93
20M 24M	14	1.93	1.9	20	≤ 2.5	18 – 16	0.93 – 1.34
14M 20M 24M	12	2.39	2.3	26	≤ 2	16 – 14	1.34 – 1.91
20M 24M	6	5	6.2	65	≤ 1	8 – 6	8.98 – 13.4
	2	7	9	115	≤ 0.6	4 – 2	21.8 – 34.5
14M	Triaxial 50Ω	3	2,6	26	≤ 2	Please contact our company	
	Triaxial 75Ω	1.59	1,4	14	≤ 3		
10M 14M	High voltage	1.59	2	14	≤ 3		
20M	High voltage	2	1.3	20	≤ 2.5		
10M	Coaxial 50Ω	1.93	2.4	20	≤ 2.5		
10M	Coaxial 75Ω	1.02	1.5	7	≤ 4		
20M	Coaxial 50Ω	0.9	1.2	7	≤ 4		
20M	Coaxial 75Ω	0.7	0.8	4	≤ 5		

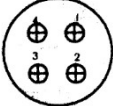
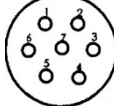
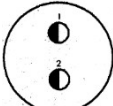
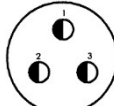
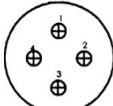
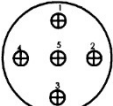
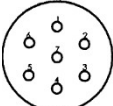

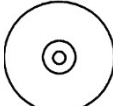
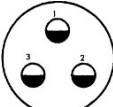

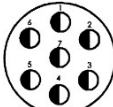
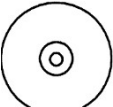


## Ordering information

Basic Series	ACX	FED	M	9M	07-20	A	60	CA
Shell type:								
RER: Jam-nut receptacle								
REC: Screws mounting receptacle								
FED: Straight plug								
PCE: In-line receptacle								
TEC: Screws mounting feedthrough								
Type of contacts:								
M: Pin contact								
F: Socket contacts								
1: Pin/Socket (for TEC only)								
Shell size: 9M; 10M; 14M; 20M; 24M								
Contact layouts (see next pages)								
Cable clamp code (nothing for RER; REC; TEC):								
A: Standard cable clamp without grounding or armor crimping								
E: Overmolding (Please contact our company)								
Code of the outer maximum diameter (Nothing for RER; REC; TEC):								
Maximum cable outer diameter (in tenth of mm, adjusted at upper five tenth)								
Example: For a 9.2mm outer diameter cable, the code is 095								
Cable code for coaxial, tri-axial (Please consult us for coding)								
Material Shell:								
CA: aluminum bronze								
Ti: Titanium alloy								
K: Stainless steel								

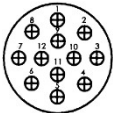
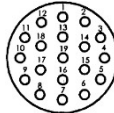
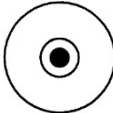
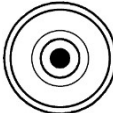
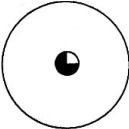
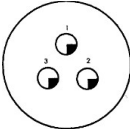
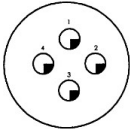
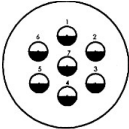
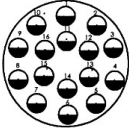
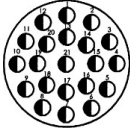
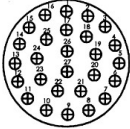

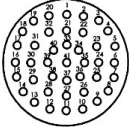
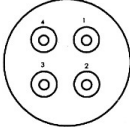
Example: To order a cable connecting plug shell size 9M with 4 pins size 16 and standard cable clamp without grounding for cable outside diameter 5.8 mm and CA – aluminum bronze give part number: ACXPCEM9M04-16A60CA

## Contact layouts

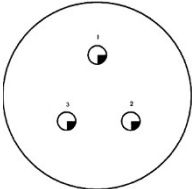
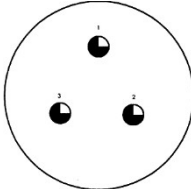
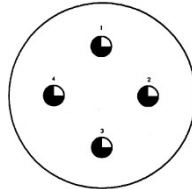
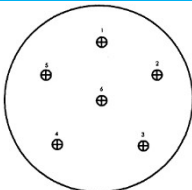
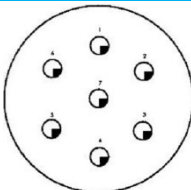
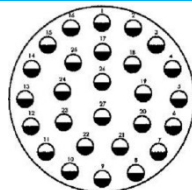
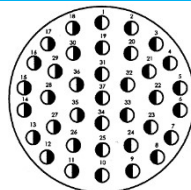
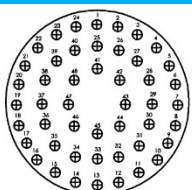
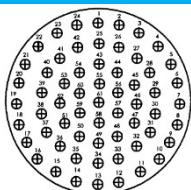
Parameters	Contact layouts		Contact Type						
			20	16	14	12	6	2	Coax.
Shell size 9M									
Contact layouts	04-16	07-20							
number and size of contacts	4 x #16	7 x #20							
Service voltage, V	1500	1000							
Shell size 10M									
Contact layouts	02-14	03-14	04-16	05-16					
number and size of contacts	2 x #14	3 x #14	4 x #16	5 x #16					
Service voltage, V	1500	1500	1500	1000					
Shell size 10M									
Contact layouts	07-20	1C-50 1C-75	01-HT						
number and size of contacts	7 x #20	1 Coax 50Ω or 75Ω	1 high voltage						
Service voltage, V	1500	1000	5000						
Shell size 14M									
Contact layouts	03-12	04-12	07-14	01-HT					
number and size of contacts	3 x #12	4 x #12	7 x #14	1 high voltage					
Service voltage, V	1500	1500	1500	5000					



## Contact layouts

Parameters	Contact layouts		Contact Type						
			20	16	14	12	6	2	Coax.
Shell size 14M									
Contact layouts	12-16	19-20	1C-50	TX-50 TX-75					
number and size of contacts	12 x #16	19 x #20	1 Coax 50Ω	1 Triax 50Ω or 75Ω					
Service voltage, V	1500	1500	1000	1500					
Shell size 20M									
Contact layouts	01-02	03-06	04-06	07-12					
number and size of contacts	1 x #2	3 x #6	4 x #6	7 x #12					
Service voltage, V	1500	1500	1500	1500					
Shell size 20M									
Contact layouts	16-12	21-14	27-16	32-16					
number and size of contacts	16 x #12	21 x #14	27 x #16	32 x #16					
Service voltage, V	1500	1000	1000	1000					
Shell size 20M									
Contact layouts	41-20	04-HT							
number and size of contacts	41 x #20	4 high voltage							
Service voltage, V	1000	5000							

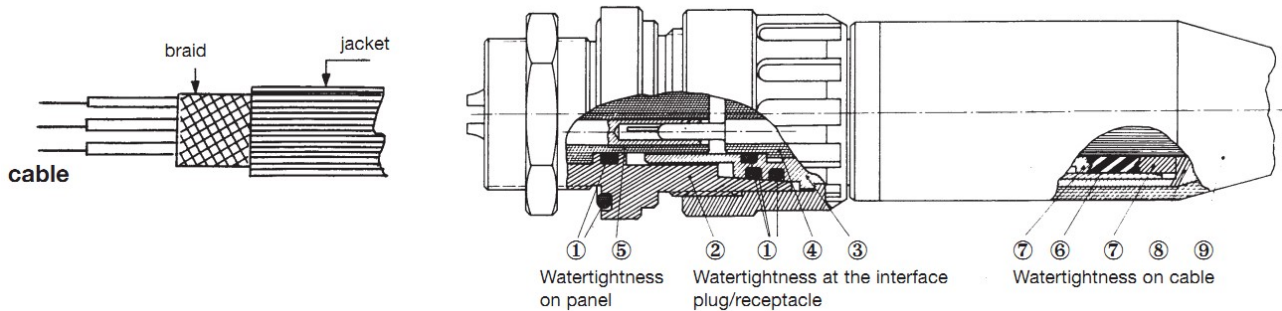
## Contact layouts

Parameters	Contact layouts			Contact Type			
				20	16	14	12
Shell size 24M							
Contact layouts	03-06	03-02	04-02				
number and size of contacts	3 x #6	3 x #2	4 x #2				
Service voltage, V	1500	1500	1500				
Shell size 24M							
Contact layouts	06-16	07-06	27-12	37-14			
number and size of contacts	6 x #16	7 x #6	27 x #12	37 x #14			
Service voltage, V	3000	1500	1500	1500			
Shell size 24M							
Contact layouts	48-16	61-16					
number and size of contacts	48 x #16	61 x #16					
Service voltage, V	1000	1000					



## Description

### Single watertightness for cables with single jacket (for FED & PCE)



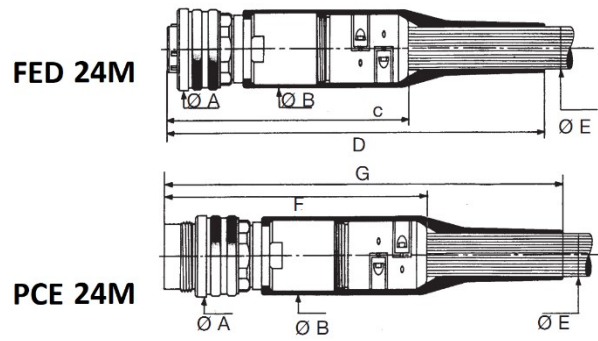
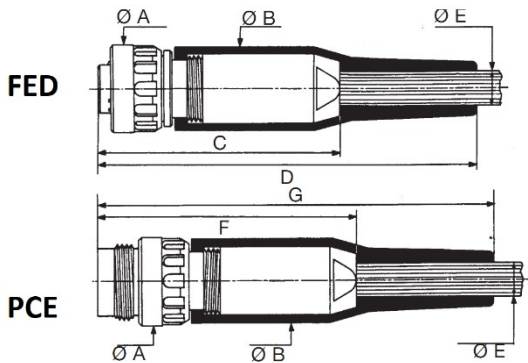
The ACX Series Single watertightness connectors are available in 5 standard sizes 9M, 10M, 14M, 20M and 24M. 100 % watertightness is achieved by both o’rings and packing washers inside the metal housings. The packing washers offer waterproofing independently of the cable clamps so that a brutal traction on the cable cannot reduce the watertightness.

Since the watertightness is not achieved through overmolding or heat vulcanization the assembling of connectors can be made outside workshop on the spot when necessary.

- The main parts achieving watertightness can be seen in the picture.
- O’rings (1) are located on receptacles (2), plugs (3) and pin and socket inserts (4) and (5).
- The packing washer (6) is compressed by metal washers (7) through screwing of the rear tightening metal sleeve (8).
- The protection boot is intended to limit the cable radius curvature.

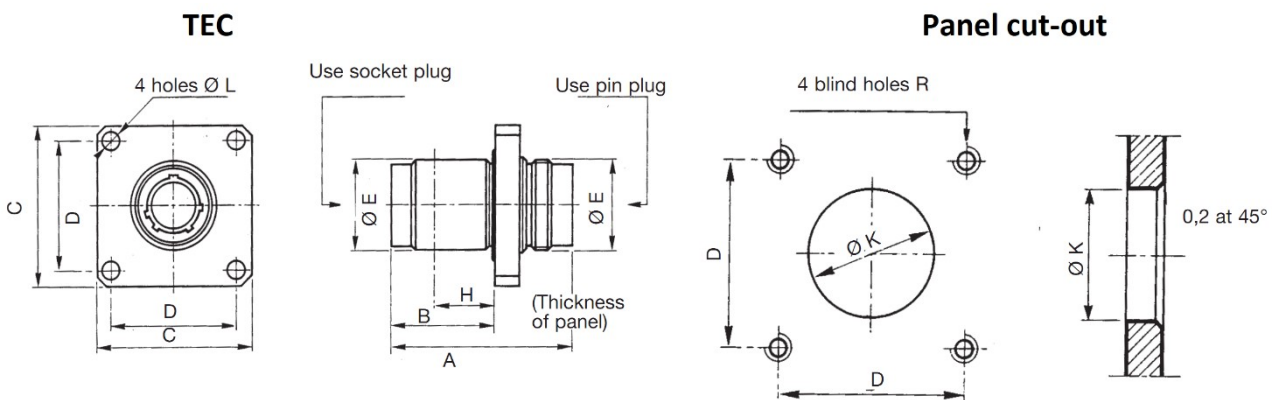
# Dimensions

## Plugs, FED & In-line receptacles, PCE



Shell size	Ø A	Ø B	Ø C	Ø D	Ø E Max	Ø F	Ø G
9M	20.00	18.00	53.00	79.00	6.20	57.00	83.00
10M	24.50	21.00	72.00	110.00	13.00	81.50	119.00
14M	33.50	30.00	90.00	144.00	16.00	99.50	153.00
20M	46.00	42.00	114.00	186.00	26.00	126.00	198.00
24M	68.00	62.00	200.00	310.00	31.00	220.00	330.00

## Square flange bulkheads, TEC

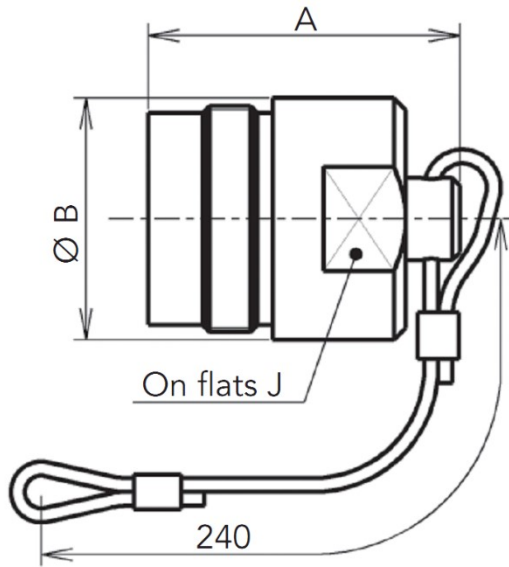


Shell size	A	B	C	D ±0.1	E	H Max	K ±0.1	L	R
10 M	60	35.5	40	31	21	20	21.2	5.3	M5
14 M	60	34.5	52	42	29	20	29.2	6.3	M6
20 M	82	47.5	76	60	41	27	41.2	8.5	M8

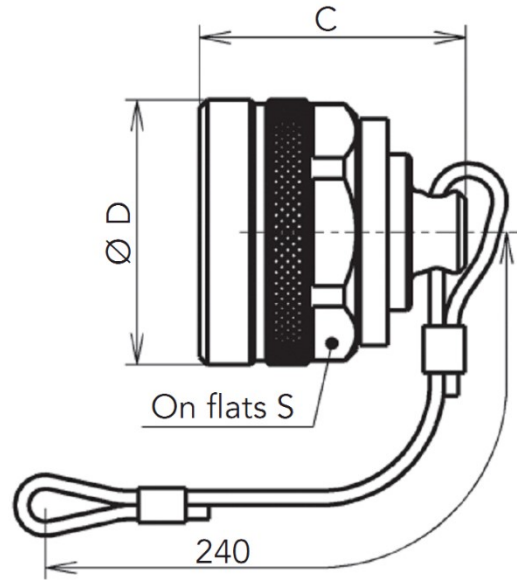


## Watertight caps

**BEF - Cap for plug**



**BER - Cap for receptacle**



Shell size	A	Ø B	C	Ø D	J
9M	30	19	27.5	20	17
10M	39	23	34	25	20
14M	40	31	34	34	28
20M	52.5	43	47.5	46.5	38
24M	71	64	69	68	54

## Ordering information

Basic Series	BE	R	C	14M
Cap type:				
R: cap for receptacle & feedthrough				
F: cap for plug				
Version type:				
C: with cord				
Omit: without cord				
Shell size: 9M; 10M; 14M; 20M; 24M				

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